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Specification as originally filed, with Application for Patent Serial No: **2,285,165**, on October 7, 1999, by **PETER TWARDOWSKI** for "A Method to Calculate a Modified Consumer Price Index".

PRIORITY DOCUMENT

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ABSTRACT

A novel method of calculating the Consumer Price Index is disclosed. The method involves a modification to the demand theory, to take into account demand over discrete time intervals and the effect time has on a modified Consumer Price Index (CPI). The Consumer Price Index part incorporates this theory with a new look at the concept of inflation/deflation and carries on with detailed analysis of the index.

TITLE: A METHOD TO CALCULATE A MODIFIED CONSUMER PRICE INDEX

Field of the Invention:

This invention relates to ecomonic indicies and in particular to a modified Consumer Price Index (CPI).

BACKGROUND

DEMAND THEORY

In most cases of economic analyses, demand is described as a relation of price and quantity holding all other variables constant. Is it correct to hold everything constant just to explore in so many details all characteristics of only two variables and at the same not to see the entire picture? The following analysis of consumer preferences takes a different approach. A new variable is included but prices and a consumer's budget are being kept as constant.

DETAILED DESCRIPTION

DETAILED DESCRIPTION

Price ratios, budget line and the third variable

According to the marginal rate of substitution, at certain price ratios (point of tangency of an indifference curve to the budget line), a consumer is willing to substitute some quantity of one good for a one unit of another. However, such substitution captures consumers' preferences only at a particular point in time. As a matter of fact, **time is moving continuously. It is the third variable** and should never be ignored.[1] How well then this theory holds with respect to time when prices and a budget are constant? For example as time goes by, a consumer might remain indifferent between purchasing rugs and purchasing paintings because time is not a factor. It is not the same when comes to bundles of goods called meals and bundles of compact discs. Assuming no other consumption, time changes discs for inferior goods. More precisely, as time goes by, the consumer is willing to give up discs at an accelerated rate not only to obtain additional meal (assuming that additional meals can be stored in the fridge) but to begin consumption of the original one. What happens here (on the graph), does the consumer move along the indifference curves or go on higher or lower ones? Movement along any particular curve implies indifference, higher or lower curves are results of changes in prices or income. The only explanation lies in the shape of these curves. The beginning of consumer's awareness about the importance of meals causes the indifference curves to move. Assuming meals on a vertical axis, the curves sooner or later must touch this axis. As time goes by, the curves become flatter and flatter. At a certain point, the consumer wants to give up the entire remaining quantity of discs since they no longer represent any utility. At that point the indifference curves are flat lines. Once the consumer begins to consume the meal, the indifference curves start to go back to their original shapes. The same process could be repeated over and over if the time gaps between each meal are that great. In reality, the consumer does not allow these gaps to happen.

If the indifference curves are moving, do they intersect? By just looking at a graph, a two-dimensional picture and adding more and more indifference curves as time goes by, a human eye

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[1] In geometry, time is referred to as a fourth dimension after height, length and depth. Because only three variables are analysed here, time is placed on a depth axis.

detects intersection of these curves. In reality or virtual reality the points of intersections are actually **the points of overlaps.** There are time gaps between these curves.[2]

NOTE:

Technically speaking, the above example is not fully explanatory.
First, an assumption of non satiation (more of anything is always better) which only refers to the stock of goods, does not imply a full consumption at once. At certain frequencies in time, only specific quantities of goods are consumed (used up). Therefore, not all indifference curves change their shapes but only those which are close to the origin, those attributable to a single meal. With respect to time, an upper bound (called consumption) exists for them and that bound is a utility maximization point.
Second, "lexicographic preferences" could be a better explanatory method in this particular case. These preferences violate the assumption of continuity by imposing restrictions to three meals a day. Regardless of the number of discs, three meals a day are strictly better than one meal or five meals. However, time is continuous by itself. At the greater or smaller fraction than three, the consumer could still place the same value for the discs.
Finally, this example shows the significance of time in a consumer's demand. It does not focus on indifference curves. Further and detailed analysis is beyond the scope of this project.

This "time" example has two very rigid assumptions of prices and the consumer's budget as constants. However, the consumer's income as well as the budget might change in time and so the expenditures for meals. The budget constraint assumption therefore does not apply well when time becomes a part of analysis. It might not seem so in the case of constant prices since they are set by producers. But even this assumption is not fully accurate. At no shortages in supply, the consumer would still be willing to pay higher prices for meals just to consume them on time. A typical example is a situation where the consumer forgets to buy groceries in a supermarket during the day and pays higher prices at a 24-hour convenient store.
Overall it should be remembered that it is rather easy but incomplete to capture consumers' preferences at a particular point in time, but it could become difficult however quite realistic to

[2] This particular example could look very well in motion pictures but not so good on a paper and therefore graphics are excluded here.

measure such preferences with respect to time. Time is an absolute variable just because nobody can stop it.

To better understand demand with respect to time, the following three sections deal with different types of goods. First section deals with those goods where demand for them have **specific time constraints.** Necessities, it is the right word for these goods. They are simply physiological needs of humans.[3] In the second section, the demand for goods does not have time constraints at all. These goods are non necessities and are psychological wants of humans.[4] The final section is about semi necessities which are goods that belong somewhere in the middle.

Demand for necessities - needs

When discussing necessities, a reference to food or meals is the best one since food is a number one necessity and there isn't a slightest doubt that it is not. Since food is a necessity then beef, pork or chicken must be as well? The answer is no. Why? The demand for necessities has specific time constraints but the demand for beef, pork or chicken alone has a budget constraint. What it means is that a consumer may never eat beef because of taste, income or a price of chicken and therefore only eat a chicken. The exact opposite may apply to other consumer. However, both consumers eat three meals a day. All consumers eat three meals a day. That's why food is a necessity but any individual food items alone are not.

How then the demand for food can be expressed in a mathematical way (demand function)? It is not a function of price and quantity but **time and quantity** (three meals a day, every day). Why then the price is missing? The answer to it lies in understanding what demand is. The problem why demand is understood as a function of price and quantity has roots in fundamental economic principals (the law of demand). Generally speaking the law says that at lower prices, greater quantities of particular goods are purchased and vice versa. But **this basic law does not**

[3] Humans, it is the right word when physiological needs of people are discussed.

[4] There must be a better term for non necessities. For the purpose of this project however, the term non necessities will not be substituted by any other term.

apply to food. Demand for three meals a day exists even at higher food prices. Why then the price and budget constraint had always been such a crucial component of demand? The answer is very simple - the economic concept of scarcity. Budgets keep consumers' demands reasonable otherwise consumers would demand (without a cost) as much as economy produces. This has definitely some merits as far as the upper bounds of demands but what about the lower bounds? The lower bounds had never been drawn in economics. The reason for it can be found in one of the greatest error in economics and that is an error in assumption, the assumption that people must have money. As a matter of fact, people need money to pay the bills and broadly speaking can't live well without money. Fact however is not an assumption. Fact is only a reality. What if some people don't have money? That is a reasonable assumption.[5] Certain goods or quantities will not be produced. But is this automatically means no money, no demands? For example, if a consumer can only afford a single meal in a given day why there is an absolute certainty that the demand for three meals exists? Because if the money is granted to pay for additional two meals, the consumer will not save such money but will buy and consume the meals like everyone else. Even millionaires consume three meals a day. Therefore when comes to necessities, people or humans have the same or identical demands and money is not an issue. What are these necessities? They are food, shelter, clothing and footwear, transportation and hygiene products. There are other necessities such as water and electricity. Water had always been a necessity but electricity became one.[6]

Are time and quantity the only variables in demand functions for necessities? The answer is no. The demand for clothes depends on an outside's temperature and temperature therefore is a variable. To write down specific demand functions for necessities could be tricky. For example transportation, at a very specific time during the day people need transportation to get to work. How then transportation should be expressed in terms of quantity as far as interrelations of a vehicle and distance? The greater the distance, the greater the needs for a reliable, punctual and

[5] That's also a fact but even this important fact was never analysed in economics. Also, the fact that the demand for three meals a day, every day exists, is really based on assumption, an assumption that the time will never stop since the demand for meals depends on time. Once the time stops, the demand for food disappears. The assumption that the time might stop is unrealistic and there is no need to justify any further an original assumption.

[6] Why certain goods become necessities is explained in the semi necessities section. Also, electricity as a necessity means that people need lights in order to see when staying up late.

fast means of transportation. But these reliable, punctual and fast means belong to psychological not physiological needs and are beyond definition of necessities. It could be hard to express them mathematically. In this project it will not be important to know the demand functions but to understand what demand for necessities is all about. Demand for necessities is about time.

Mathematically speaking, time is the independent variable (input numbers for a function) and quantity a dependent variable (output numbers for a function) in a demand function for food. Price is missing because quantity demanded depends only on time. As time goes by, the quantity demanded is not affected. This can be easily verified from food consumption. At higher food prices, consumers would not wait for them to come down but buy whatever quantities are required and that's simply true. On the other hand, all those consumers without money would still demand food at zero prices (free). But the overall result cannot be zero since time and quantity are never zero. That's precisely why, time and quantity are the only variables in a demand function for food. The exact opposite occurs for beef, chicken or pork (non necessities) as mentioned earlier. These demand functions have two variables price and quantity. Time is not a variable even though everything happens at some point in time.[7] At the elastic portion of the demand curve, price is an independent variable. When "taste" takes priority over price changes (an inelastic portion), quantity becomes the independent variable.[8]

Demand for necessities is constant and continuous. As time goes by, the physiological needs of humans don't change and demand doesn't go up or down, it is the same. Such constant and continuous demand will be a key factor in the Consumer Price Index analysis. But for now two crucial things about necessities must be remembered. First, the demand for necessities has specific time constraints and the demand for non necessities budget constraints. Second, people don't need to have money to have demands for necessities and that's economics.

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[7] Technically speaking that's not correct because for non necessities, the occurrence and duration of demand depend on the recognition of price, duration of that price plus other psychological factors of consumers. For the sake of simplicity it is OK to say that price and quantity are the only variables here.

[8] This will be explained in the semi necessities section.

Demand for non necessities - wants

This section is about consumers. Who should be classified as consumers? For sure people who have money but from non necessities point as well, all those who can afford necessities and much more.

The most characteristic feature about non necessities is an ambiguous process of consumers' decisions which results from abundance of available choices and alternatives.

There should be no doubt that unlike food, compact discs are non necessities. They simply fall into a category of psychological wants and pleasures.

The following non necessities' example is a long one but it shows quite well what demand for non necessities is all about.

If there is a consumer who has a CD player and one thousand discs and thinks of buying additional nine discs, what factors does she or he consider? It should be mentioned first that the ratio of one thousand to nine, existing to new discs had been carefully chosen. Such a ratio is simply at the edge of a propensity to consume, not a sharp edge of one thousand to one but still the edge. So, if the consumer would like to add nine more discs to already such large collection, it is simply a matter of quantity, but to be more specific, what if the consumer wants to buy all nine symphonies of Beethoven (one symphony on a disc) performed for example by the Toronto Symphony even though the consumer has these symphonies however performed by the Montreal Symphony? Will there be a difference in interpretation, how much difference? What does the consumer like more, Beethoven or the Toronto Symphony? If the answer is Toronto Symphony then the consumer should perhaps look among one thousand discs to find symphonies by other composers played by the Toronto Symphony and enjoy the music without additional expenditure. If the answer is Beethoven then the consumer should be satisfied with the Montreal Symphony. But if the consumer appreciates the music of Beethoven as equally as performances of the Toronto Symphony (even if for some unknown reasons there aren't in the entire collection many compact discs combining these two), then the consumer still has a great

dilemma of demanding only the difference but facing to pay a full price for the discs. This type of demand could be called a **marginal demand.** In this particular case of marginal demand, the consumer doesn't know the utility maximization point and hesitates to buy the discs.[9] There is some good news to it. From time to time compact discs are offered at discounts. The consumer doesn't know when nor how much however **can wait** for prices to come down and then decide again. In the meantime, a salesperson approaches the consumer trying to sell a cellular phone just by saying that it's time to diversify the taste and enjoy the full value of the product (the consumer never had a cellular phone before). The salesperson understands that the consumer's demand for discs is marginal and is quite optimistic about the "shift" from the marginal demand of one product to a full demand for another product.[10] That's not everything. Another salesperson sells stocks and bonds and thinks that it isn't a bad idea to wait for discounts on discs. This salesperson tells the consumer how great returns on investments are and advises to invest now and when discs are on sale, withdraw only a required amount from the original investment, retain the rest and still earn an interest. The consumer hesitates because in a long run the price of discs goes up however, likes the idea of investing.
In this particular case the consumer can only make a single choice. Buying discs, a cellular phone and investing the money all together means, consuming only a single meal a day for an entire week and that is not a rational decision.

The classical music lover can take time and carefully choose the best deal because time in this case is not a factor. It might not be so if a consumer is a pop music listener and also has one thousand discs and plans to buy few more. Such a consumer could place the highest value for the latest hits and waiting for discounts means compromising and buying classics. This consumer also thinks of buying a cellular phone and investing the money but all together faces a different dilemma. Among one thousand discs there are many oldies which no longer bring satisfaction as

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9 Marginal demand can be defined as positive expectations in the rate of change in marginal utility resulting from demanding additional, not identical but a similar product (or the difference in that product), after the difference in prices of both products is calculated and the original product can still be consumed.
In the case of discs, even a small increase in marginal utility can be offset by frequent listening to symphonies.

10 The term shift in demand is going to be used differently here than it is used in economics. Shift in demand will refer to the shift in a focus of attention.

do the latest hits. But even the latest hits will soon become classics. The decision therefore must be made quickly because time is a factor here. Someone could be inclined to say that the demand for these discs has specific time constraints, the same as necessities. That's true with one major exception. The consumer does not have to buy them. Therefore, **specific time characteristics** not constraints, is the appropriate term for non necessities.

Unlike necessities where demand is continuous and solid, the demand for non necessities is not. It can appear and disappear as in the case of a pop music listener and if marginal (the classical music listener), is subject to captivity by salespeople.
What hasn't been mentioned yet is that changing demands which are so characteristic to non necessities contribute to complexity and quality of life. If necessities can be described from the point of cost of living, non necessities make up the standard of living. Understanding demand for non necessities could be difficult and only advanced topics may cover the material thoroughly.

Demand for semi necessities

There should be some system classifying necessities and non necessities because certain goods create problems. For example appliances such as refrigerator or stove, if it is necessary to store the food and cook the meals, are appliances necessities? What about a haircut, is it a matter of fashion or hygiene? Umbrella, if it protects the body from getting wet, does it serve physiological needs? People can't live without money so must have wallets to carry them? At the end comes bread, eggs and milk. Why most people buy them regardless of price?
It is impossible to classify all goods into two categories without a doubt. There are thousands of goods which belong somewhere in the middle. A reference to them as semi necessities is the best solution. It takes critical thinking to find out what these goods are. However, it can also be done in a real life experiment. Such experiment could be difficult but achievable. Several consumers would be given lots of money but asked to spend only a bare minimum on necessities and not to spend on anything else if possible. As time would have gone by, some consumers could not resist and start spending on other goods. The important part of it is to know the chronological order of expenditures with respect to time because further and further they can be postponed,

less and less of necessities the goods are. The point of it is to prove that semi necessities are not equal because they are not bought at the same time. They are simply a creation of a growing standard of living. With comfortable and growing budgets people repeatedly buy them, later depend on them and can't live without them. The dependency on semi necessities for a long period of time is therefore a creation of necessities. How much is needed to live, is really a question where do people live. In a civilized world a phone or a watch can "practically" be called necessities because 95% population or even more have them. The best example however is electricity. Now electricity is not only a necessity alone but also a commodity which cannot be excluded from the use of appliances. But even in a civilized world there is poverty and people have to live on tied budgets. Such people could be a good indication how to draw the line between necessities and semi necessities however, their budgets are not the same and in many cases, demands could exceed budget constraints. Good intuition and abstract thinking is perhaps the best guidance to understand the difference.

Another category of semi necessities goods are those which will never become necessities. Food items such as bread, eggs, and milk belong to an important group of this category. It is crucial to notice here that there are no substitutes for water and electricity, that's why they are necessities. Also there are no substitutes for food but unlike water or electricity, food is an aggregation of items which to the certain extend, substitute and complement each other. If for example the price of bread goes up, a consumer might substitute bread for rice or potatoes, but how convenient these substitutes are? If the consumer is only able to maximize utilities in terms of meals (necessity) but unable to maximize utilities in terms of taste (non necessity), are such substitutes satisfactory? Definitely not because most consumers pay higher prices for bread because are not willing to forego consumption of bread. One major reason for it is the growing standard of living where bread becomes more and more affordable and therefore, the demand for bread does not disappear in time. That's why bread should be considered as a semi necessity. Only very high prices can cause a shift in demand from bread to other goods. Someone may still ask why beef, pork or chicken are non necessities if consumers are unwilling to forego them because standard of living goes up? It is a very good question and it's hard to give a straight

answer. Beef, pork and chicken can be all considered semi necessities because consumers never eat bread only, but meat as well. However, the price of bread is much lower than the prices of meat. Higher bread prices may not affect quantity consumed but higher meat prices may encourage consumers to look for other solutions to a good, affordable meal. Why lobsters, oysters and caviar are not necessities?

The most characteristic feature of semi necessities is **time and quantity as independent variables** and price as a dependent variable in a demand function.[11] To explain this differently, there are two ways to do shopping. First is to take for example $100 and shop around for deals and discounts. Second is to list all goods needed to be bought, take the money, go out and buy them. In a first case price is the independent variable because quantity demanded depends on price or, the demand is for the right price. Time is not significant and at high prices, nothing might be purchased. This is very true with non necessities. In a second case the demand for bread, eggs and milk for example is actually a demand for specific quantities of specific goods at specific time. The demand curve for semi necessities is therefore inelastic. More inelastic the curve is, more of necessities the goods are. The exact opposite occurs for non necessities. More elastic the curve is, more of non necessities the goods are. However, the demand for non necessities can be inelastic as well. That's true but why? It only depends on consumers' budgets. Time constraints can play a key role in identifying non and semi necessities.

CONCLUSIONS

If price can be excluded from the concept of demand then what really is demand? Is it anything more than a recognition of needs and wants and the desire to consume and enjoy goods which satisfy these needs and wants? The acceptance of such definition creates implications. The basic economic principle of supply and demand express the interests of consumers and producers in one very universal way and that is the language of money. The concept of demand however

[11] Unlike necessities, the demand for semi necessities has a price and that is a sharp line of distinction. Also, the demand function for semi necessities is a consumption function for necessities. Consumption of necessities occurs at cost.

becomes more complex when time replaces price in necessities and could become even ambiguous by adding more non monetary factors to it. If demand is indeed a recognition of needs and wants then is it correct to call demand what is known as the demand curve?[12] It's easier to answer this question by explaining why the word demand should not be used for this curve. For example, if there exists an economic entity with high poverty and some people can only afford a single meal a day, is such economy in equilibrium? Definitely not because supply of single meals does not intersect demands for three where in fact the equilibrium is.[13] If people consume only what they can afford and suppliers take into account such afford ability, is **consumption** the better or the right word for what's known as the demand curve? There is a very strong assumption in favour of consumption. People don't buy goods and not consume them because otherwise, it would simply be uneconomical.[14] To say that in a simpler manner, goods are supplied for consumption. Also in a general and aggregate sense, at higher prices less will be consumed and vice versa. This very much resembles the fundamental law of demand. The remaining question is how demand fits in the entire picture if there are only two curves: supply and consumption?[15] The complexity of demand can make it hard to graphically explain it but it's there and will be there. It is a set of different signals which may or may not trigger an interest and response of suppliers and producers. An understanding of demand means an understanding of economic foundations.

This section closes with a new economic joke just to justify one more time why consumption is the right word for what's known as the demand curve and demand being a wrong word. Question: What is the difference between consumers and humans? Answer: Consumers are all those who have money, humans are all those who have demands.

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12 Non monetary factors are also present in supply but all goods are supplied only and only at cost and to simplify this argument, supply is assumed to be the right word for the supply curve.

13 This work does not lead to analysis of conditions for equilibrium. It is now obvious that demand, supply and consumption of necessities must be in harmony in order for an equilibrium to exist.

14 Is acquisition of goods a process of demand or is it a beginning of consumption? It is not physical consumption but once consumers incur the cost, the consumption is assumed to happen.

15 The consumption curve overlaps the supply curve because of the time gaps, first goods are produced then consumed.

CONSUMER PRICE INDEX

In this part, the demand theory with respect to time will be used to question the existing methodology of the Consumer Price Index. Before getting into the index, a new look at definitions and concepts first, is imperative to understand the full idea of price movements and how all of it fits into the CPI. The analysis of the index provides recommendations for a change and should be looked at with an objective criticism just because there are real issues there and the stakes are high.

What is a pure price movement?

Statisticians measure pure price movements by taking into account all improvements made to the products which are being measured. Pure price movement is therefore a price movement of the same product from one period to another. This concept however is only a tangible one. There are many intangible features causing prices to move. These features significantly overwhelm the tangibility concept because they are the real sources of price movements. In this section (because it is about the CPI), only those features applicable to consumers are going to be examined. Supply of goods and monetary policy are assumed to be all right.

Demand

As mentioned in a non necessity section, consumers' demands are changing and appear and disappear in time. It all results from a volume and variety of choices available to consumers in the market. The velocity of shifts in demand and the duration of demands will never be known since they happen in consumers' minds. In many cases it is incorrect to say that at very low prices demands still exist. The pop music listener had technically speaking free discs to satisfy musical pleasures but still considering to buy the brand-new stuff. On the other hand, higher prices may not affect quantity demanded because if the classical music listener buys a cellular phone, such a consumer can only identify a level of personal desire and match that with the

asking price. If this is a first cellular phone, the level of such desire is high and the consumer probably doesn't know historical prices of the phones which could be lower.
In general, retailers don't know what's happening to consumers' demands but a lack of response from consumers causes prices to be adjusted accordingly, prices therefore go down. Prices can also go up if consumers too often make impulsive expenditures due to sudden fascinations. Demand is perhaps the most important intangible feature which explains price movements.

Timing

A silence from consumers is not necessarily a signal to retailers that the demand for a product no longer exists. The consumers' comfort of postponing expenditures has an effect on price movements. Consumers simply wait for prices to come down and buy when the time is right. But waiting can also backfire. If too many consumers enter the market for a product at the same time, the prices can rise because there will be shortages in supply. The real source of the reason in this case is not shortages but bad timing and timing, is an intangible one.

Savings

Changing propensities to save has the same effect on prices as timing. Saving is a future's consumption. The so-called lack of consumers' confidence sometimes is nothing more than a growth in savings even when there are no layoffs and the incomes don't change.

Why necessities?

It is very obvious that all intangible features of price movements apply only to non necessities. No human saves money by cutting on meals, no human waits for the right time to buy them because, the demand for three meals a day exists and will exist. Necessities therefore should become a focus in measuring inflation because the concept of pure price movements applies to them. With necessities many technical problems can be eliminated right from the beginning.[16] It is practically impossible to do that with non necessities. There are always going to be intangible movements. What about semi necessities, do they create problems? The answer is yes and no but the food section in major components will explain the phenomena about semi necessities.

[16] This is only a general idea because to measure price movements for meals, one must measure prices of food items which are semi and non necessities. It will be explained later.

Inflation, deflation, a problem of inflation and a problem of deflation

Traditionally speaking, inflation and deflation are the end results of reasons causing price changes even if all the reasons are not necessarily known. This general concept includes all the goods and services produced in the economy. But more specific terms could be used to address price movements for necessities and non necessities. These terms will not be brought here. Instead, the notion of "a problem of inflation and a problem of deflation" will be evaluated. For example, if the price of compact discs and the food prices go up, the word inflation comes in as an explanation for both. If consumers pay those prices, is there a problem of inflation in both cases? Consumers don't have to pay higher prices for discs but they want and they do. On the other hand, consumers may not want to pay higher prices for food, but they must. These two are not the same inflations because there isn't a problem of inflation when comes to discs since consumers voluntarily pay higher prices for them (assuming that they know about it), but there is a problem of inflation when comes to food prices since consumers can do nothing about it. So, the problem of inflation applies only to necessities because of time constraints. What about a problem of deflation, is it simply an opposite to inflation? The problem of deflation occurs because there are no time indicators when non necessities have to be purchased when their prices keep going down. Technically speaking however, it shouldn't be a problem since consumers are simply taking advantage of lower prices in the future.[17] The only real problem of deflation is a scenario when consumers trade necessity goods between themselves knowing that prices of these goods will be significantly lower in the future and therefore keeping money in saving accounts. However, this situation is highly unlikely to occur in today's world.

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[17] Unfortunately, it is a problem in macroeconomics.

CPI analysis

WEIGHTS

Weights are the reason why CPI requires changes.
This part focuses on weights.
Why?

What if all goods in the Consumer Price Index can be classified as necessities, semi necessities and non necessities or to make it simpler, necessities and non necessities? What if consumers spend 50% on necessities and 50% on non necessities? What if there is an inflation of 5% for necessities and -5% for non necessities (deflation of 5%) or vice versa? The Consumer Price Index will read this as 0% inflation (no inflation). Is that correct?
In a big picture it might seem correct because the existing methodology applies weights which come from surveys of family expenditures. It is not correct since measuring non necessities' prices means not measuring pure price movements. But that's not all, there is something more important which makes the entire system very vulnerable. If for example, individuals save or invest money for future's consumption (long term investments), do they know what exactly will they spend on? Not exactly but for sure on necessities since the demand for necessities depends on time and does not disappear. More, most individuals save much less than they earn and according to a forward- looking theory of consumption, when these individuals become seniors, they might not be able to maintain the same standard of living as they did in the past when being employed because of a dependency on fixed incomes. The type of standard of living fixed income people face can be hard to estimate. The only way to do it is to measure existing expenditures of seniors and then apply weights accordingly. However, this excludes all those who are saving for their retirement now while being in a labour force and have many years ahead before becoming seniors. Therefore, it is impossible to know the future's weights. That's

perhaps why the present methodology does not address the future at all. It cannot really do that because the weights are unknown or they have to come from somewhere. The only thing which remains certain is a demand for or a consumption of necessities. So, if necessities have 5% inflation or 5% deflation, is it correct to say that the inflation rate is 0% since non necessities make up the other 5%? The answer is no because such an inflation rate does not apply to savings or investments. At continuing 5% deflation for necessities, seniors in particular will benefit from lower prices in the future but keep losing at 5% inflation. To leave the existing methodology without a change is just risky. It is better to make changes now because there are only modest price movements in the Canadian CPI. Not doing anything now could mean dealing with unknown in the future if the price movements become uncommon.

But how to make any changes if the future's weights are unknown? The remaining of this project is about solutions to a "rate" problem for savings and investments. A core solution to it is a Consumer Price Index for necessities only. This rather simple and straightforward index will have advantages of pure price movements.

One index versus two indexes

If any CPI measures price movements for necessities only, it is technically speaking a new CPI. What should happen to the existing one?[18] The question here is whether or not an index for necessities only, satisfies the "all purpose" requirements. The simple answer is no because not knowing the trends in non necessities' prices means not knowing the trends in demands for these goods. But such trends are not an indication of inflation because demands for non necessities change and prices together change as well. However, a continuity of the non necessities' index might bring other benefits besides the traditional quote of the inflation rate. Therefore, this index should not just disappear.

The CPI for necessities only, could solve the rate problem for savings and investments. But would such an inflation rate also apply to employment contracts and wages? From the CPI point alone however, there is a tremendous difference between savings and wages. Weights are the

[18] Just to mention that the weights of the existing CPI do not apply to savings but the weights of a new CPI would have to come from somewhere. The question of weights will come back later.

difference. From one year to another, wages of workers do not fluctuate much which means that most full time workers earn almost the same money in two subsequent years. They are a typical example of CPI expenditures - weights and (with an assumption of error) might continue to buy the same non necessities goods. If these workers spend 50% on non necessities and 50% on necessities, how should their wages be adjusted in a case of 5% inflation for necessities and 5% deflation for non necessities? It seems at first that there is no need for an adjustment of wages, since most workers make the same expenditures from one year to another. However, there is an issue of savings or a propensity to save. That percentage of income should be definitely adjusted. As a result of it, wages should go up slightly. But this is only a theory and it may not work at all in a real life. Paying 5% more for necessities could mean not having this 5% to pay for other goods since an adjustment of non necessities' prices might be strictly related to a lack of money and therefore, lower prices for non necessities do not reflect their cost and value. If on the other hand goods are bought on credit, 5% deflation for non necessities can be a result of shifts in demands for a better quality goods and measuring current prices of once highly demanded goods might be an explanation for deflation which is in reality an obsolete data. So, there is a strong possibility that in a case of 5% inflation for necessities workers could demand a 5% wage increase just because price movements for non necessities are not a good indication of real prices and trends in expenditures. The great controversy however could happen in a case of inflation for non necessities and deflation or no inflation for necessities. If there would be no inflation for necessities but 10% inflation for non necessities, should workers receive a 5% wage increase?[19] In this particular case the employers could make a point. The point is why would anybody knowingly pay higher prices for non necessities and then demand higher wages accordingly? Isn't it better to take more time and shop around for deals? The response of workers would be simple. They work hard for their money and everything they don't want to buy is cheap, but everything they do is expensive.

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[19] The 5% upward shift in an inflation rate instead of 5% deflation for necessities and 5% inflation for non necessities, helps to explain the controversy of wage increases better since the debate focuses on a 5% increase.

The controversy of wage issues goes beyond the scope of this project. The existing CPI could become vulnerable every time a noticeable discrepancy in rates between necessities and non necessities occurs. This applies to wages as well as savings.
Would then an inflation rate for necessities only, be sufficient for the purpose of wage negotiations? The intuitive answer is yes because it would only be a major indicator of the direction in wage adjustments, it should never be an automatic, full adjustment by itself.[20] Also, the significance of necessities and their price movements is too prominent to treat it equally with non necessities. Above all, wage negotiations go far beyond statistical information and inflation. They consist of factors directly related to the performance of businesses and these factors might be the key issues of attention.

The most important reason why non necessities should not be measured for the purpose of an inflation rate is a scenario of higher non necessities than necessities' prices. As a result of it, the overall inflation rate would go above the necessity rate (assuming substantial expenditures for non necessities) adding to the cost of borrowing money. If people's demands go up which shows in higher prices then why should this add to the cost of borrowing money?[21] The entire economic growth depends on the cost of financing. It is OK to measure price movements for necessities to protect the cost of living but it is not OK to protect the standard of living. Wouldn't the best alternative of protecting standard of living be through economic growth and prosperity which by itself brings a higher standard of living? Should concerns of higher prices for non necessities become a thing of the past?[22]

Weights for necessities

The above argument about necessities and non necessities has its **roots in weights.** Why in weights, here is an explanation. In 1938 expenditures on food accounted for 31% of Canadian

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[20] An automatic, full adjustment is indeed appropriate for minimum wage jobs but not for high paid professions. However, that is true in a case of inflation because in a case of deflation, an adjustment of minimum wages for even lower wages (assuming no regulations) would cause labour disputes.

[21] How raising the interest rates in this case can be explained, is this fighting inflation or fighting demand?

[22] Is traditional method of fighting inflation too costly in today's highly developed world?

family's total consumption. In 1967 expenditures on food went down to 24% of total consumption and in 1996 down again to 17%.[23] Over the years weights for food are steadily going down and that creates a real problem. If for example visitors from another planet would come to visit earth, by reading the Canadian Consumer Price Indexes they could conclude that as time goes into the future, humans demand less and less food but more and more readings and recreation. Why they should draw such conclusions? Because if humans apply lower and lower weights to food, food automatically becomes less and less significant price movement to them. **That's wrong.** Price movement for food is the most significant price movement now and in the future and therefore, food should always have the highest weights. That's why an argument about necessities and non necessities has roots in weights since the continuation of an existing methodology could bring even lower necessities' weights in the future. But in order to apply the highest weights to food, weights for other goods must come down or some goods must disappear from the index. Non necessities will disappear to give the way to necessities.

Where should the weights for necessities come from?

The existing application of the CPI weights is based on the surveys of family expenditures. Higher expenditures on goods reflect in higher weights for these goods. This method can be called an **expenditure factor** method since weights purely reflect expenditures. The problem with this method is the growing standard of living which ultimately results in lower weights for food as already mentioned. However, the expenditure does not mean the cost. If for example people spend more time with their computers, the overall hydro bills will go up since more electricity is used but the cost of electricity expressed in kilowatt-hours may remain the same. With respect to necessities the cost is what really must be known in application of weights. It also means that for the purpose of weights, consumption of electricity should be narrowed to

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[23] Sources:

1. Dominion Bureau of Statistics, Prices and Price Indexes, 1913-1940, Catalogue no. 62501, Table 22.
2. Dominion Bureau of Statistics, Urban Family Expenditure, 1967, Catalogue no. 62-530, Table 1.
3. Statistics Canada, Family Expenditure in Canada, 1996, Catalogue no. 62-555-XP B, Table 17.

The estimated numbers were calculated by applying 100% to the total current consumption.

necessities' consumption using electricity's cost as a base. By doing this all non necessities' weights are eliminated. This approach can be called a **cost factor** method.
However, the demand for necessities has specific time constraints. Should the time also be taken into consideration? If the answer is yes then how to account for time when the demand for all necessities has equal time constraints which means that physiological needs do not discriminate or that the recognition of a lack of any need automatically triggers demand for that need? Even though the demand for all necessities is equal with respect to time, necessities by themselves are not equal. Why food is a number one necessity, becomes obvious just by going back in time as far as possible, as far as the beginning of human's existence. Why electricity is not a number one necessity also becomes obvious by going back in time. This simple exercise is a good guidance in defining the difference between deep core and shallow core necessities. It can be used for all necessities. So, to take time into consideration when weights are concerned, the length of time of existence of any particular necessity should be an indication for the weight. This is a **time factor** method in application of weights. Deep core necessities should therefore have higher weights than shallow core necessities.

If the cost and time factors answer the original weights' question, this still doesn't tell how to combine these factors together. The problem is that it is impossible to do it right for two reasons. First, it is easier to numerically apply weights according to the cost of necessities but it is very hard to establish the time factor or a significance of any necessity and then numerically apply the weight. To say that in other words, how much more important is food than electricity? Second, if such importance can really be established, how then a time factor should be combined with a cost factor? What's more important, the cost or the significance of a necessity or, are they perhaps equally important? How should these relations be expressed numerically?
There is no solution to this problem but it doesn't mean that the time factor should be excluded to make it simpler and accurate. Why the time factor is significant becomes evident in the following composition of weights for necessities. These weights are **only intuitive** application of numbers to the cost and time factors. Both factors are treated equally.

Food	**37%**
Shelter	**30%**
Clothing and f otwear	**14%**
Transportation	**8%**
Hygiene products	**2%**
Semi necessities	**9%**

The most noticeable thing besides the numbers is the inclusion of semi necessities in the necessities' weights. Now it should be clear why the argument about necessities and non necessities excluded semi necessities. Semi necessity goods such as food items are included in a food component but those independent ones such as watches and wallets are included in their own component. This is a necessity index after all because most semi necessities belong to the necessities' components. That's why they are called semi necessities. Only 9% weights are assigned to other semi necessities.

Water, electricity and natural gas are included in the shelter.

With respect to cost and time factors, there is no further justification of the weight numbers assigned to necessities. However, "major components" will reveal more about necessities and why a particular necessity weight number might be appropriate in comparison with the other necessity weight number.

The above weights could remain for as long as there is no further creation of necessities; otherwise, they are only a temporary solution to the problem of growth in necessities.

MAJOR COMPONENTS

Food

Is 37% a high number or a low number assigned to food? This number might be just about right because Canadian winter causes shelter's weights to go up. Shelter in Canada is almost as significant as food. In warm climates the shelter's weights could be lower but the food's weights higher. The climate addresses only a cost factor because the time factor is identical for food and

shelter. It means that every human would like to consume three meals a day, every day, and sleep approximately eight hours every day. Food, shelter, clothing and footwear are the deep core necessities. All together, they take a very high percentage of the total weights.

So far, three types of food groupings have been introduced. The first type includes semi necessities such as bread, eggs and milk. The second type includes beef, pork and chicken which are non necessities. The third type was mentioned only once. It includes lobsters, oysters and caviar. Those three groupings are sufficient to explain what food as necessity really means. Food simply means a daily survival. Lobsters, oysters and caviar are therefore not only non necessities goods, they are luxurious goods. Their high prices partly explain the reason for the term. The other and the real reason for these goods being known as luxurious lies in quantities available to consumers. These goods are scarce to begin with and therefore are not a part of the daily meals. That's because they are only supplied by people, however they are produced by nature. Nature does not produce enough for everybody anymore. It also means that people or suppliers of these goods don't have a total control over future's quantities produced. Changes in supply of these luxurious goods can further affect demand and prices. As mentioned earlier, a pure price movement concept assumed monetary policy and supply of goods to be all right. The significant lack of human control over renewable natural resources makes the entire fishing industry unsuitable to satisfy the concept of a pure price movement. For the purpose of measuring food prices as necessities, seafood goods should be excluded.

The remaining two types of food groupings also don't satisfy the concept of a pure price movement since according to the demand theory, only the food does. That's correct but unlike expensive seafood goods, these goods make up the daily meals. The composition of daily meals does not necessarily change over time. This means that statisticians could tell without a reference to surveys what people eat for breakfast. Coffee, tea, juices, muffins, cereals, pancakes, waffles, eggs, bacon, ham and toast would certainly be identified. What are the chances of these goods disappearing from the menu if they have been part of the menu for a long time? In other words, longer and longer the goods make up the daily meals, more and more of necessities they become. There is a chance that some items could disappear once and for all

giving room for a better, healthier food products, however, it is practically impossible that all of the sudden consumers forgo the consumption of all existing breakfast goods in favour for other goods. In time therefore, the composition of a breakfast meal does not change much. It might not be quite the same with lunch and dinner meals since consumers' incomes determine how much beef, pork and chicken will be consumed. But if the quantity consumed is not affected from one period to another even if there is a change in prices of these goods or a change in consumers' incomes, it simply means that the change in prices or income reflects a change in expenditures on other goods because there is a strong taste preference for beef, pork and chicken. In such cases, it could be possible to measure the price of daily meals since the consistency of quantities is not affected by any other variables. If on the other hand there are significant shortages in supply, the composition of meals would change but unlike the seafood, people produce and supply beef, pork and chicken and therefore have almost a full control from the beginning to the end of a supply process. The total control in production cannot be achieved in grain products because of the dependancy on weather conditions. However, the price of bread is low and the demand does not disappear. It seems therefore that a compromise must be taken in order to measure pure price movement for meals. In reality there isn't a pure price movement just by itself because it wouldn't be a one in a first place if everything else remained constant. But the trick here is to know the factors causing prices to move and whether or not it is possible to deal with them.

Price movement for meals is an alternative to price movements for food. It eliminates many intangible variables which are characteristic to the consumption of food with relation to the standard of living and focuses on a necessity aspect of price movements. It could be used as an absolute price reference since such price reflects interests of everyone at all times.
It should be obvious that consumption of meals in restaurants is not necessity consumption. Even if consumption of meals in cafes and restaurants recurs at every lunch break, the continuity of such consumption is not sufficient condition to consider this a necessity because, eating out has no time constraints whatsoever. Eating out therefore should not be measured in a necessity index.

Prices of fruits and vegetables available only seasonally can be measured because once they become available, consumers take advantage of it and for that specific period of time, adjust the pattern of daily meals.

Special care should be given to agricultural subsidies. Subsidies in general have political foundations of keeping agricultural industry on a solid ground. The real issue is not so much about subsidies but a rate of change in price of any particular product as a result of a rate of change in subsidies from one period to another.

Only main issues were mentioned in a food component. The complexity and volume of the technical and practical aspects of the methodology make it hard to go into further details and that's why only a general idea has been introduced. Everything else might be left as it is.

Shelter

What is location, location, location? It is a standard of living because there aren't two identical locations. Location therefore has always been a crucial identifier of that standard. Location on the other hand has nothing to do with shelter. Shelter means a place to sleep, a place to rest. It doesn't mean home, a backyard or real estate ownership. If the demand for a place to sleep does not change but the demand for location does, then how to measure inflation with respect to shelter as necessity when every shelter must have some location? The only solution to it is the exclusion of land from shelter. This leaves with construction costs of the shelter which are the only indicators of inflation. The inclusion of land could lead to pure price movement errors since it is impossible to account for an impact of drug dealers coming into and going out from the neighbourhoods on price movements or, an impact associated with employment opportunities in certain geographical areas. The exclusion of land will not reveal the true, full cost of shelters but this is not what measuring inflation is all about. It is about measuring a rate of change. What must be known in this particular index is the rate of change in the price of shelter as necessity but not the rate of change in the standard of living.

The best way to find out about shelters' construction costs is at the new home developments.[24] All costs are combined together and add up to a single price of home. A home or a house is what people buy. They don't just buy a shelter. This means that new homes could include swimming pools, recreation or exercise rooms. Changes in prices of new homes could come from changes in non necessities' costs. The way to deal with it is to eliminate ornaments and concentrate on bricks and mortar. Bricks are bricks whether they are used to build the bedroom or recreation room. It doesn't mean that an Industrial Product Price Index should become a better reference to construction costs, it means that the price of shelter, not a price of home should be defined. A construction industry uses a jargon of "square footage" to define construction costs. Such reference applies to any size of the shelter and could be a better alternative in tracing costs.

Because shelters are durable goods, only few people move-in to new shelters in any year. This creates a technicality problem because a total inflation rate for the shelter component is derived from only few prices of new shelters. It must be mentioned that what is really being measured here is actually a rate of change in opportunity cost for everyone living in current shelters. Those shelters will eventually deteriorate to the point that they are no longer suitable for use and prices of new shelters should therefore be everyone's interest. Someone may want to make a point that the deterioration process is slow and a life expectancy of a shelter is greater than a life expectancy of a human and therefore, prices of new shelters might be of no concern to a person who has recently moved-in to a new shelter. That is partly correct with two major exceptions. First is that an opportunity cost is continuous and no concerns to any particular individual might become some or even great concerns to his/her children and grandchildren. Second, employment opportunities become global and a job hunt no longer focuses on a neighbourhood and vicinities. That's why knowing the prices of new shelters should be everyone's either direct or indirect interest.

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[24] A definition of home as a shelter includes apartment buildings, detached and semidetached houses, but it excludes seasonal and recreational properties.

Measuring opportunity cost explains the rationale of the concept but it still doesn't deal with a problem of so few numbers for so many, 30% weights. If 7% of these weights can be assigned to water, electricity and natural gas since they are supplied to homes, then remaining 23% are construction costs. What if there are no new home developments in a certain year? The only solution to it is leaving the inflation rate for shelters blank or read it as zero inflation. In a case of very few developments, only low weights of 5% to 10% for example may be applied. The 23% weights are appropriate if enough data are available to have a view of the entire picture. But the whole thing can still be controversial because prices of new homes (technically speaking) dictate the entire inflation rate for the shelter component. The only alternative to offset an impact of such data is to change the significance of shelter from 23% to for example 10% in the necessity index and redistribute 13% weights elsewhere because the next best alternative is not to measure shelter at all. It should be stressed one more time that the concept of shelter is a very unique one since it separates land from a building. The inclusion of land leads to errors because location is not necessity.

Clothing and footwear

Clothing and footwear is quite simple comparing to shelter. The line must be drawn between necessity and fashion and that's all there is to it. It may seem difficult since all new clothes are fashionable, conceptually however it is not because it's easy to understand the difference. Since all new clothes are fashionable, drawing the line becomes a challenge. The objective here is not to eliminate fashion completely but rather to identify fashion. If some clothes and shoes are worn on a daily basis, they can be considered necessities or precisely speaking semi necessities. If a dress for Saturday night is not suitable for any other day of the week, it is not a necessity dress. But the real challenge begins with professional attire, necessary in today's workplace. The only way to find out how to deal with this issue is from surveys since people's intuition could be the best indication what they understand by necessities and what they want to be measured. Because the issue of professional attire might be controversial, lower time factor weights (in comparison with deep core clothing and footwear necessities' weights) might be applied here. The 14%

weights in a necessity index which seem to be high in relation to transportation's weights, also reflect physiological changes happening to humans until the age of maturity.
All sport's and recreational clothing and footwear should be excluded from a necessity index. All jewellery and other decorative items should be excluded as well.

Transportation

Why transportation's weights are so low (only 8%) can be justified by explaining what transportation as necessity really means. Transportation in general is a method of relocating people and merchandise from one place to another. Transportation as necessity is a relocation at specific time constraints. But transportation as necessity also means that the primary objective of transportation is relocation, therefore, transportation in this respect is not a time saving device. But what really transportation in today's world is? It is a major technological progress affecting enormously the standard of living in every household. Why then the weights are so low when expenditures on transportation are increasing? The weights are low because the basic needs of people don't change.[25] What people really need, is a vehicle to relocate them from homes to the place of work but what do they get? They get air bags, ABS, power steering, radio and much more from the technological paradise. Is automobile industry of the private sector unsuitable to satisfy the concept of a pure price movement? The answer to this question cannot be given alone because in order to do that, other topics including public transportation must be discussed all together.

Transportation is a transition from a deep core to shallow core necessities. Transportation does not universally serve the purpose for everyone since seniors who may stay most of the time at home, or children who have (technically speaking) a walking distance to schools do not require transportation to the same degree as working adults. But even working adults use different means of transportation. Some of them prefer private transportation, but others prefer public transportation. The preferences for private transportation where public transportation is available reflect to the great extend a standard of living. The cost becomes a secondary issue since convenience and time savings take a main objective. But on the other hand, public

[25] Just to mention that transportation of merchandise is excluded because this is CPI and only the basic, physiological needs of people are considered.

transportation is also convenient and saves time especially in large metropolitan areas. On top of that, public transportation gives the very basics of transportation excluding all diversification of products the car industry offers to individuals. It seems here that public transportation is the one which should be considered as necessity since it can well and uniformly satisfy the fundamental needs of many without any individual bargaining for price and product position. This might be considered true as far as large cities since the demand for such transportation will not be significantly altered even at the growth in standard of living because of congestion problems in cities, however, it is not true in small towns and remote rural areas. Private transportation is the only one there. The problem of defining private automobile industry as necessity lies in the continuous growth in technology. If a car can be considered the basic mean of transportation in Canada just because it is affordable and because there aren't any others, so commonly identifiable means as cars, then what is an affordable bicycle in China? Is it a necessity or recreation device? Because the main feature of necessities (beside specific time constraints for their demand) is a lack of substitutes, to what extend can a bicycle in Canada be considered a substitute for a car? To what extend fluctuations in car prices affect demands for bicycles as far as the concept of a cross elasticity of demand? Not much or hardly at all because the demand for cars is not so much a demand for necessities but a demand for a standard of living. Why this statement is correct, can be verified from living habits of people. People in general prefer to incur the costs of transportation just to be able to live in their dream homes once such homes are found. People or working adults do not locate close to their jobs and relocate every time new jobs are found. To say that in another way, the demand for standard of living creates necessities and transportation is a very good example of it. Transportation is not a deep core necessity.

The above argument only explains why the percentage number for transportation' weights is low but it doesn't tell what should be really measured and how. The reason for it is that transportation is the most difficult component of all just because it is hard to define as necessity and because technological progress by itself creates necessities. For practical reasons, both private and public transportation should be measured. There is no golden rule as to the methodology therefore, an assumption of error must be admitted. In general and with respect to

pure price movements, only deep core necessities are relatively easy to measure because further away one goes, a higher probability of errors occurs. This underlines that measuring price movements will never be perfect due to complexity of the concept. Applying low weights to transportation is also a way to minimize an overall error making the entire inflation rate a more reliable source of data.

Hygiene products

Hygiene products component is similar to clothing and footwear. The line must be drawn between hygiene products and cosmetics. Low weights reflect mainly low expenditures on these products. Due to a striking similarity between this component and clothing and footwear, no further comments are included here.

Semi necessities

These are actually new necessities which haven't been included in the index yet. They became necessities as a result of growth in the standard of living. The surveys of family expenditures can identify what these goods are. If 95% of population or more have them, then these goods should be measured. The surveys should also ask which goods people think should be continuously measured and which can be skipped. If for example most households have television sets but there is a great chance that the technology of television might be combined with a computer industry, people may not be concerned with the current TV prices. On the other hand, they may want to know the prices of refrigerators on continuous basis since there isn't anything new coming in the refrigeration industry which in a near future could substitute current refrigerators completely. But there is one thing which shouldn't be asked from people and that's an application of weights to those measured goods and the application of weights in the entire index. The problem could arise once people start applying for example 30% weights to this (semi necessities') component just because they think of the goods as expensive. This would create a problem of giving more weights to semi necessities (or shallow core necessities) and at the same time, taking away weights from deep core necessities. As a result of it, price movements for refrigerators for example would start becoming relatively more significant than

price movements for food if the refrigerators' prices keep rising on continuous basis but food prices don't. This would result in going back to a current system of applying the expenditure factor into the weights.

However, the biggest concern about the semi necessities' component lies in the problem of growth in necessities. The weights in the necessity index do not address this problem. They only show how differently understanding and measuring inflation can be. The continuous growth in necessities would force an adjustment of weights in the entire necessity index. That's why weights are so crucial in the entire methodology and will probably receive a great focus of attention in the future.

Non necessities components

This section explains very briefly why certain components are not considered necessities and why they are missing in the necessity index.

Health care

It might be the most controversial issue whether or not health care is a necessity. Once people get really sick, the physiological needs for a cure become the most essential needs. In this respect health care can be considered necessity. There are many reasons why it is excluded in the necessity index. A very practical reason is that health care in Canada is provided at the public not a private sector which means that consumers pay only a small portion of the entire cost from their after tax incomes. The inclusion of even a small portion of private expenditures on health care in the necessity index could create misunderstanding what inflation really is. In the case of no overall inflation, could inflation for health care alone be a reliable signal to raise the interest rates? The science of health care becomes more and more a science of immortality. How should the demand for immortality be assessed with respect to money? Fear of death creates demand for health care, but fear is a very psychological, not physiological feature. Also, expenditures on health care do not only occur at the time of sickness but they have a preventive approach and that makes the difference in individuals' wants. The demand for health care therefore is easy to

define at the time of sickness but it is not during the health of individuals. The biggest reason why the cost of health care should not be measured at all is the direct contribution of technology into the benefits and progress in health care. Because of that, the entire cost of health care is immeasurable with respect to benefits derived from it.

Education.

It is not a necessity since there are no physiological needs and no time constraints for education. If all kids start to go to school at the age of seven, it does not explain why they don't do so at the age of ten. Education is very habitual and intellectual aspect of life.

Household operation and furnishings

Certain items as beds, sofas, tables, chairs, appliances and few others might be included in the semi necessities' component. Overall, these goods are rather expensive but they also have long life expectancy (25 years for appliances). Because of that the weights are low and there is no need (in this project) to include these items in a separate component. It must be mentioned that many people buy new furniture from a perspective of interior home design and fashion even though still having used ones to serve their basic needs. These types of buying habits are nothing more than a marginal demand and they should be taken into consideration. The rest of the household operation and furnishings component includes non necessities.

Readings, recreation, tobacco and alcohol. These are clearly non necessities components.

SUMMARY

The Consumer Price Index part and even the demand theory were barely introductions. Only the key issues were introduced to create a framework for more analyses. There might be thousands details there which need to be worked out and explained. But the focus of the entire

project was on a main idea, an inclusion of time in the demand theory and applying that theory into the CPI. This gives new foundations for further studies by economists and statisticians. As the demand theory showed, analysing three variables brought new arguments and new results. If in the future economic analyses more variables can be included, an understanding of demand will flourish. Psychological features such as fear, greed, jealousy, ignorance or fun might be in some cases the most prominent ones affecting demands and they should not be ignored. It seems that analysing all at once in some economic concepts might be the better way to go than analysing only certain fragments and keeping everything else constant. The complexity of demand cannot be explained in the graphs and therefore the demand functions together with language should be looked as the new tools to do so.

As far as the CPI, there is much more to the concept of price movements once the demand with respect to time is introduced. **There would never be a problem of inflation without time constraints for necessities.** People could simply fight inflation just by waiting for all prices to come down to a desirable level and buy when the price is right. Necessities don't allow that. Because of today's highly developed and technological world, drawing the line on necessities is the most challenging task. However, it can be done and it must be done. Once it's done correctly, the Consumer Price Index for necessities only, can be the most reliable source of data for quoting the inflation rate.

Is there anything else which hasn't been mentioned yet but seems to be important? The answer is the actual inflation rate for necessities. But why such an important matter was omitted? There are two reasons for it. The current methodology of collecting information does not draw the line on necessities. In some cases it can be controversial what necessities are and only a mutual agreement of the public at large can identify the desire to measure or not to measure certain goods. But in order to do that, very different surveys and questionaries have to be issued to consumers. This is rather a minor reason why the actual inflation rate hasn't been quoted. The major reason is that it is not important what the actual necessities' inflation rate is, but what it is going to be. Inflation was always understood as the overall upward price movements for all the goods and services produced in the economy. But if the new definition of inflation can be

restricted to necessities, how differently can this affect the notion of the problem of inflation? Monetary policies of the central banks directly deal with the problems of inflation. As far as the current understanding of inflation, these policies are successful in Canada and United States in particular. Because problems of inflation are problems at the national levels, an actual inflation for necessities will only maintain current or launch a new policy to deal with inflation. That's why the future's inflation rate at continuous basis is the best test for any policy. How quickly can any policy be implemented and when it will become effective is another question.

Is it possible to have zero inflation for necessities once and for all?[25]

Because the significance of necessities was emphasized throughout this project, references to goods, not services had been made. Unlike services which require mostly human resources, production of goods requires human and capital resources. With the exception of water, fresh air and sun, most necessities must be produced using available capital resources. To even consider zero inflation for necessities, one very important condition must be met. **The economic concept of scarcity must never apply to necessities.** If this condition is not met then somebody might be inclined to say that the cave man and cave woman were better off than a modern human since they had enough of everything they needed lo live. In different terms this condition can also be read as comfortable abundance of human and capital resources to produce necessities on time and on continuous basis. As probably noticed, this condition addresses only the quantity aspect but not the cost aspect of necessities and at the same, alters the definition of the concept of scarcity. Because economic goods are those which are scarce, they cannot be provided free. But is it appropriate to say that not free means scarce? There is no doubt that lobsters, oysters and caviar are scarce goods because no matter what people might be willing to pay for them, there will not be enough for everybody if nature, not people produce them. The real issue therefore focuses on capabilities of productive resources to satisfy everyone's needs at the willingness to incur the cost since cost becomes a subjective matter. The biggest problem of scarcities in necessities lies in resources. The best example of it is mining. Recent attempts to utilize the solar energy is the right way to go since solar energy is a renewable source of energy. What all of this

[25] Monetary policies are designed to deal with inflation. This section examines whether or not it is possible to prevent inflation.

means in terms of scarcities in necessities is a going concern about capabilities to sustain long-run production of necessities based on available resources. Once humans become confident of having significant control over long-run supply of necessities, then they may expect only modest price movements of the productive resources or not expect any price movements at all.

However, it also requires human resources to produce goods. Scarcities don't really apply to human resources in a traditional economy. Unlike the rocket science where knowledge and expertise might be hard to find, shortages of labour in a traditional economy can be quickly overcome by learning on a job and apprentice programs. These shortages can also be forecasted and appropriate actions taken a head of time. Therefore, the issue of rising prices for necessities as a result of rising wages cannot have roots in shortages of labour. There are other reasons for it. The most common one is a bargaining for higher wages. Such bargaining whether collective or individual, explicit or implied (quitting the job because of low salary), has very psychological and economic roots. It can be called an opportunity cost for the value of work. It means that higher wages for the same job paid in different company attract negotiations. But it also means that certain well-paid professions attract a workforce. More well-paid jobs are created for example in the technology sector, keeping young individuals on the farms becomes harder unless they can earn more. This rising opportunity cost is a problem and is perhaps the best explanation of wage hikes. So, here is another condition for no inflation; **an opportunity cost for the value of work must never go up.** It seems that the problem of inflation may persist because in today's world the technology sector is booming and the foreseeable future for this industry is bright. This is right in one sense and technology's jobs are indeed well paid. However, it doesn't necessarily mean that the technology sector drives the opportunity cost. An opportunity cost addresses everything. By everything it means: hard work in elementary and secondary schools to obtain good grades, undergraduate and graduate education including students' loans, postponing marriages and other private affairs to obtain education first, downsizing, restructuring and other corporate affairs, reacquiring new skills on continuous basis to keep up with progress and technological innovations, disappearance of nine to five jobs, disappearance of job security and, at the very end comes demand. Demand for non necessities goods at the consumer level is

unstable which also causes a loss in job securities. But what is the real reason for such unstable demand? The reason lies in **absolute time constraints for consumption.** By absolute time constraints it means that nobody can extend 24-hour life cycles of humans. On average, it takes eight hours to sleep, another eight hours or even more to work, some extra time for meals, daily hygiene, transportation and after all, there is not much time left for anything else. Even though, sometimes consumption cannot be precisely defined with respect to time (a good example of it is a satisfaction derived from paintings and other decorative products), the issue of time constraints remains in all cases where the time to consume a product can be defined. In terms of unstable demand it means that consumers have many alternatives but not enough time to consume everything they would like, even when their budgets allow to do so. This leads to making choices and demanding higher quality, better products all the time. In economics the focus had always been on budget constraints but not much if hardly at all on time constraints. The budget constraints can be overcome by borrowing money. Nobody however can borrow time in a real sense of the meaning. The exception to it is the fact that people live longer because they succeed in taking care of themselves but the 24-hour absolute time constraints are there and it's impossible to do anything about it.

All of it relates to opportunity cost for the value of work in a very direct manner. Taking everything into consideration, it is not clear to what extend such opportunity cost may have an impact on upward price movements in a near future. Even if the economy can keep producing more using recent technology and innovations, the consumption is often limited by absolute time constraints. Isn't the 1999 overall inflation rate some reflection of that?

The answer to the original question of zero inflation for necessities once and for all is yes. However "yes" only implies that it's possible. It means that unlike traditional method of fighting existing inflation, it is possible to take a pro-active approach to prevent price movements for necessities right from the beginning. The pro-active approach seems achievable when dealing with capital resources but it might not be so easy when dealing with people. The psychology of

human behaviour is immeasurable and only absolute time constraints for consumption can keep opportunity cost of work stable.

Time constraints impose strict limitations on opportunities.

The specific weights and examples set forth above are provided to illustrate the invention and are not intended as limiting. Additional methods within the scope of the claims will be apparent to those skilled in the art.

Claims:

I claim:

1. A method to calculate a CPI number comprising the steps of:

implementing weights for necessities and semi-necessities, including selected non-necessitites goods in necessities components, based on cost and time factors only, and

adjusting for government subsidies.